

# White Paper Report

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Application Number: HT5004611

Project Director: Jijun Tang (jtang@cse.sc.edu)

Institution: University of South Carolina Research Foundation

Reporting Period: 10/1/2011-12/31/2012

Report Due: 3/31/2013

Date Submitted: 3/25/2013

## **White Paper**

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## Activities:

The Center for Digital Humanities (CDH) of University of South Carolina, joint with the Institute for Computing in Humanities, Arts, and Social Science (I-CHASS) of University of Illinois at Urbana-Champaign, conducted two workshops in summer 2012. The first workshop was held from June 10-14, at the National Center for Supercomputing Applications (NCSA), UIUC. The second was held from August 5-9, at University of South Carolina, concluded by a virtual conference in September.

The overall aim of the session was to expose scholars in the humanities to new possibilities for research offered by advanced computing (computing applications that address open research questions in computer science) and high-performance computing (computing applications that require a high volume of computational resources not found in personal computing hardware).

To achieve this goal, CDH and I-CHASS conducted the following activities:

1. We offered six major subject areas in sequence over the course of the session: computer vision/image analytics, visualization and virtual/augmented reality, network analysis, computer game development, mobile application concept and techniques, as well as software engineering and project management.
2. Throughout introduction to these technical areas, we held periodic processing conversations to discuss connections, advantages, and disadvantages each method offered, as well as brainstorming ideas for potential projects.
3. By the end of our August session, we organized an open discussion to share project ideas and identify potential collaborations. Participants formed small groups of 2-4 people and began to form proposals for future research topics.
4. In Sept 29<sup>th</sup>, we held a virtual conference where eight groups presented their topics and received suggestions and comments from both the participants and instructors involved with this project.
5. We matched two groups of researchers with people from ICHASS and matched other five groups with senior undergraduate students in the Computer Science and Engineering Department in University of South Carolina, forming teams to polish ideas and develop functional prototypes.

## Accomplishments:

This project had two workshops and one concluding conference. There were 25 national and international participants attended both sessions. Each session we invited about 5 local participants.

### Workshop One (UIUC):

#### **Day One: Sunday, June 10 2012**

Morning – Introduction to Computer Vision, Image Features and Machine Learning

Afternoon – Introduction to Matlab, Digitization and Search, and Basic High Performance Computing

#### **Day Two: Monday, June 11 2012**

Morning – Scientific Visualization, Information Visualization, and Visualization in the Humanities

Afternoon – Generating 3D Content

**Day Three: Tuesday, June 12 2012**

Morning – The Reality Continuum - VR, AR, and Personal Fabrication

Afternoon – Field trips to networked DH resources: CUCFablab, Hahti Trust

**Day Four: Wednesday, June 13 2012**

Morning – Social Network Analysis in Practice

Afternoon – Text Mining: from Text to Concepts, Metadata, and Relationships

**Day Five Thursday, June 14 2012**

Morning – Introduction to Groupscope and Hathi Trust (Scott Poole, I-CHASS)

Afternoon – Next Steps: Open Lab, Brainstorming groups, and Discussion of Future Projects

**Workshop Two (University of South Carolina)****Day One: Sunday, August 5 2012**

Morning – Game Concepts and Analysis

Afternoon – Introduction to Unity3D

**Day Two: Monday, August 6 2012**

Morning – Using Unity3D to Create a Simple Game

Afternoon – Game Control and C# programming

**Day Three: Tuesday, August 7 2012**

Morning – Game Interactions

Afternoon – Graphics and Animations

**Day Four: Wednesday, August 8 2012**

Morning – Android Development Environment

Afternoon – Android Application with Views and Controls

**Day Five: Thursday, August 9 2012**

Morning – Software Engineering Concepts and Practice

Afternoon – Final Conversation and Evaluation, Forming Groups for Research Projects

**Audience**

There were 25 national and international researchers participated in both workshops. There were about 10 local researchers participated in one of the sessions. The background of these participants represented fields included business, art and design, art history, philosophy, literature, Native American studies, library science, African American studies, videography, cinema studies, and a number of practicing artists.

We created a live streaming of some of the workshop materials from  
<http://www.ustream.tv/channel/dhhcp-workshop-at-usc>.

**Evaluation**

We are currently teamed with 14 of the participants on designing and implementing seven research topics, all with good progress. We were contacted by other two members recently to build mobile applications related to their research. In other words, we are supporting ~60% of our workshop participants to pursue new frontiers in digital humanities.

## Continuation of the Workshops

Two augmented reality, visualization, and network analysis projects spun out of the Illinois session to become the groundwork for individual research efforts and multi-site collaborations, with support from I-CHASS instructors. One of these projects subsequently submitted for NEH startup funding in the ensuing fall of 2012.

Five groups proposed topics related to gaming and simulation, thus we teamed them with senior undergraduate students in Computer Science, University of South Carolina, when they were seeking topics to fulfil their Capstone project requirement. Each team is maintaining close contact and interactions to refine project aims, requirements and designs, following strict software engineering practice. Currently each of the project is being developed and fully functional prototypes are expected to be released in April 2013.

We expect all these projects will encourage our participants to pursue funding opportunities and we plan to keep contact with them and provide necessary helps if needed.

## Long Term Impacts

I-CHASS' previous foray into exploring high-performance computing and its intersection with the humanities ("Humanities High-Performance Computing Collaboratory", IATDH 2008) exposed a small group of scholars to multiple supercomputing facilities, grouping them by scholarly interest. In an effort to reach a wider audience and allow for interests to emerge on site, this HpC took a different approach of using a large group (around 30 participants for each workshop) and introducing them to a variety of topics that covers a wider spectrum.

Our approach emphasized creativity and imagining new pathways for scholarship even as instructors gave basic tutorials for how to think about computer vision, implement network analysis, deploy augmented reality visuals, form game/simulation ideas and produce game and mobile applications. This larger-scale learning environment that was ambitiously interdisciplinary: in addition to the technical fields, represented fields included business, art and design, art history, philosophy, literature, Native American studies, library science, African American studies, videography, cinema studies, and a number of practicing artists.

The goal of HpC was to stimulate researchers and put them in a position to lead themselves and others in exploring new frontiers for digital humanities collaborations. Imparting hard skills that would translate into robust knowledge of a field or piece of software beyond the period of the session, while an ideal outcome, did not happen in our estimation. A number of participants began pursuing research in the fields to which they were exposed. Our strategy of teaming-up humanity researchers with computer scientists is experimental, but the results are promising.

## Grant Products

We offered two workshops to provide interdisciplinary trainings on six major areas related to HpC for humanities. Both workshops were recorded and live streamed. They can be accessed through [www.dhhpc.org](http://www.dhhpc.org). Seven research projects are proceeding, with prototypes available in early May 2013.